Yakama Nation Fisheries

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July 12, 2019

US Environmental Protection Agency, R10
c/o Sean Sheldrake, Regional Project Manager
1200 Sixth Avenue, Suite 155, M/S DOC-01
Seattle, Washington 98101

RE: Portland Harbor - Yakama Nation comments on the PDI Evaluation Report, Portland Harbor Pre-Remedial Design Investigation and Baseline Sampling, submitted to EPA on June 17, 2019 by AECOM and Geosyntec

Dear Mr. Sheldrake:

The Yakama Nation submits the following comments regarding the above-referenced draft PDI Evaluation Report in order to assist EPA with upholding its trust obligation. We have had limited time to review the contents of this report and intend to submit additional comments on or before July 19, 2019. This report was submitted to EPA on behalf of the Pre-Remedial Design (Pre-RD) Administrative Order on Consent (AOC) Group (Arkema, Evraz, Schnitzer, and The Marine Group). The PDI Evaluation Report evaluates the post-Record of Decision (ROD) sampling data collected between March 2018 and May 2019 (and other data) to update Site conditions prior to remedial design. It also advocates for major modifications to the Remedial Action Levels (RALs), Sediment Management Area (SMA) footprints, and remedial technology assignments which, if implemented, would reopen the ROD, remedial investigation (RI), and feasibility study (FS); cause significant delays; and result in a remedy that is not protective of the resources. Below are general comments about overarching concerns we have about the PDI Report. These comments were prepared in collaboration with Ridolfi Environmental and Avocet Consulting. More specific comments are attached.

General Comments

1. **Baseline and PDI data collection has proven invaluable.** Overall, the collection of an updated site-wide baseline dataset is a critical accomplishment and will be useful for refining the conceptual site model, establishing baseline conditions, and informing the remedial design process. However, in its current format, this report does not achieve these goals.

2. **Scope of report deviates heavily from AOC.** This PDI Evaluation Report deviates extensively from the primary objectives of the 2017 PDI AOC. The report includes valuable data and some of the interpretation required by the ROD; however, it also includes numerous and voluminous sections (Appendices E through L, approximately 1200 pages) that are outside the appropriate scope of this report and the ROD. The AOC Statement of Work (SOW) states that the report should include a summary of the investigations performed, investigation results, tables and graphics of validated data and data validation reports, and photographs of the work. The PDI report goes far beyond this to include proposed revisions to the background values, target spatially (or surface) weighted average concentrations (SWACs), RALs, SMAs, risk analysis, food web model, contaminant of concern (COC) list for long term monitoring, capping amendments, and remedial technology considerations. This out-of-scope work is a distraction and much of it has already been decided through dispute resolution, is premature or should be evaluated on an SMA-by-SMA basis, and/or uses heavily flawed methodology or logic.

3. **Recommendations would result in reopening of the ROD and significant delays.** The proposed changes would require a rewrite of the ROD, which is not the intended purpose of this report and would delay the remediation by years, if not decades. We urge EPA to stick to the 2017 ROD and reference the Administrative Record which has decided many of the extraneous analysis. Nothing that has been presented warrants changing the cleanup criteria, especially the RALs, which are sufficient for moving forward with remedial design. The Yakama Nation began documenting our concerns with potential pitfalls and cleanup delays that the PDI Evaluation Report could present during ASAOC negotiations in 2017. EPA agreed with many of Yakama Nation's concerns and assured us that this report would not result in reopening the Portland Harbor RI and ROD, as documented in EPA's November 30, 2017 response to dispute resolution on the Pre-RD ASAOC. Since then, EPA has continued to commit verbally and in writing to not changing the ROD.

4. **Overstates significance of system-wide natural recovery and uses invalid/misleading comparisons.** The report focuses heavily on conclusions of rapid and broad site-wide recovery by comparing contaminant concentrations in numerous media between 2004 and 2018. These comparisons are invalid, apples to oranges comparisons for numerous reasons. First, the PDI Report looks at data in different ways than the ROD (ex. updated RALs; different scales, detection limits, and interpolation methods). Second, the studies were designed for very different purposes, with the 2004 study being biased higher to identify hotspots and the 2018 study unbiased (resulting in lower concentrations) with random, stratified site-wide coverage. Third, recovery varies widely by location. Fourth, past recovery does not necessarily indicate that the future recovery trend or rate will be protective. Removal of hotspots is vital to recovery and the Administrative Record provides analysis for how much source removal would be needed to achieve protectiveness. The PDI Report even notes "the highest COC concentrations tend to diminish at a faster rate than lower concentrations. Less change is observed at lower concentrations as levels approach equilibrium." Lastly, the paired location comparisons indicate that there is spreading or smearing of SMA hotspot edges in some areas likely due to river flow

and boat traffic (ex. border of Downtown Reach, Arkema, McCormick and Baxter, Willamette Cove, mouth of Swan Island Lagoon). These should be priority areas for expediting cleanup.

5. **Explanation of Significant Differences (ESD) is not final**. The PRPs analysis looks at PAHs looking only at ESD PAH values and does not include evaluations using ROD PAH values, which are currently the applicable criteria. This is unacceptable.

6. **Re-hashes decisions already made.** Many of the arguments included in the report are already issues that have previously been identified, evaluated, and considered in the ROD. These issues are a distraction and delay tactic and EPA should not be expected to rehash them again. For example, food web model, background, and use of RIFS data for temporal comparisons all have extensive dispute resolutions records and final decisions. See administrative record for past RI, FS, and PP issues and disputes. The ROD responsiveness summary also revisits many of these decisions.

7. **Minimizes SMA areas based on multiple flawed lines of reasoning**. The report builds upon the numerous (flawed) rationale listed above to diminish the size of active cleanup (SMAs). This is unacceptable. Natural recovery will not proceed at a rate adequate to achieve protectiveness without significant source removal.

Yakama Nation's Recommendations

Because of how far off the mark this report is, as well the time-sensitive nature of this data, it is imperative that EPA: (1) disapprove and decline further review of the PDI Evaluation Report; and (2) only accept data that meets data quality objectives (DQOs) to refine the conceptual site model and inform the remedial design process. Due to the significant effort and resources that would be required for EPA and the MOU partners to collaborate, comment on, and revise this document, the Yakama Nation reiterates our June 20, 2019 recommendation to EPA to disapprove the PDI Report in order to prevent a hindrance or delay of the Portland Harbor cleanup. In doing this EPA will be able to continue to work towards its July 31, 2019 site-wide AOC execution revised goal, stop spending federal resources on an ASAOC that is already over the spending cap, and begin utilizing the data gathered by the Pre-RD group. This path forward is outlined under the AOC, Statement of Work, section 5.6 (a)(v):

> "disapprove and decline further review of the submission, in whole or in part, where EPA determines that its review will require additional data or analysis, the performance of which will exceed funds available or hinder or delay cleanup."

In addition, the baseline and PDI data supports the position to use all necessary tools to engage responsible parties in remedial design efforts as soon as possible. The data show spreading/dispersion (increasing concentrations) of contamination in lower concentration areas (ex. near edges of the hotspots) at the border of the Downtown Reach, RM 7W-Arkema, McCormick and Baxter, Willamette Cove, and the mouth of Swan Island Lagoon. These should be priority areas for expediting cleanup.

Please do not hesitate to contact me with questions. I can be reached at 509.985.3561 or shil@yakamafish-nsn.gov.

Sincerely,

Laura K. Shira, P.E.
Yakama Nation Fisheries, Superfund Section

Attachments:
Specific Comments

Yakama Nation, Comments on the Portland Harbor PDI Evaluation Report, dated June 17, 2019

Specific Comments – Main Text, Tables, and Figures

Main Body. The main text, tables, and figures do not address the purposes of the ASAOC, nor do they comply with the ROD. Instead, the report body presents a biased and political agenda to reduce costs by shrinking the ROD SMAs and changing the ROD compliance metrics. The majority of the information pertinent to the ASAOC can be found in Appendices A (lab reports and data tables), B (field sampling reports), C (database), and D (results and analysis), with Appendix D analyses being the evaluation that should have been summarized in the main body. We recommend that EPA focus on the useable data and information presented in Appendices A through D and prepare an independent baseline summary to serve as a more useful foundation and reference for remedial design and long-term monitoring.

Section 2.1.1. Section 2.1.1 of the report notes that the site had an average of 0.9 ft. of deposition in SMAs between 2004 and 2018. However, this rate varies throughout the Site and does not account for seasonal variation. The deeper areas generally had more deposition, and the nearshore shallower areas had less. The SMAs are generally located close to the shoreline and experienced significant erosion: Figure 4 from Appendix D.1 shows bathymetry change several feet deep (depicted in blue) in numerous SMAs, even when dredge events are excluded (an estimated 21% of the erosional area is attributed to dredging operations according to Section 2.1.1 of the report).

Even in areas where sedimentation is occurring, sedimentation cannot be relied on for recovery in areas where river depths must be maintained for navigation and habitat uses.

Table 3.1. Table 3.1 in the PDI report proposes to revise the background concentrations (and therefore the cleanup levels) upward based on the new data on upstream sediment concentrations of PCBs, arsenic, and dioxins/furans.

The revisions to background are not appropriate. Per Table 7 in Appendix F.1, the mean PCB concentration in the Downtown and Upstream Reach is 9.62 ug/kg, which is very close to the background value of 9 cited in the ROD. The PDI report proposes using the 95 percent Upper Confidence Limit (95 UCL) on the mean, which is 20.4 µg/kg. Given the close match between the ROD background value and the new measured mean of 9.62 µg/kg, and the absence of any need for a conservatively high estimate on the background concentration, it is more reasonable to retain the previous determination and use the mean rather than the 95 UCL.

Specific Comments – Appendix A – PDI Chemistry
Specific Comments – Appendix B – Field Sampling Reports
Specific Comments – Appendix C –PDI Database

We have not had adequate time to complete a review of these appendices. Up to this point, we have relied on EPA to review the data and field sampling reports. However, we are waiting for EPA to release their independent analysis of this raw data to the TCT. We respectfully reiterate our request that this information be released prior to the final comment deadline.

Specific Comments – Appendix D

General. This study has provided a comprehensive and valuable updated data set for multiple media through the Portland Harbor study area, Downtown Reach, and Upstream Reach, which was the primary goal of the study. Overall, Appendix D is the type of information we would have expected to see in the main PDI Report, rather than the advocacy and opinions that made up the entirety of the main text. The reader should have the opportunity to independently evaluate the data prior to reviewing interpretations of the data.

Specific Comments – Appendix D.1 – Bathymetry

General. Bathymetry data must be used on a site-by-site basis (smaller scales) in conjunction with other lines of evidence, and not in broad-sweeping site-wide generalizations. This appendix (section 3) concludes that "…the Site is hydrographically and geomorphologically stable on a large scale, which allows for Site recovery processes to be effective." It also states that the data "provides confidence that areas of the river with concentrations of COCs above the CULs have not changed substantially (dispersed) and that in situ remedial technologies will remain permanent and stable under normal and event-driven stresses until cleanup goals are met." We argue that the report's focus (within the main text and this appendix) on generalizing and lumping 10 river miles is irresponsible and masks what is going on at SMA and smaller scales that are more meaningful to understanding recovery and impacts to the resources. Although the larger site does appear to be 'net depositional', it is spatially and seasonally variable. With respect to deposition, some SMA hotspot areas are neutral or erosional and some areas experience higher areas of disturbance (ex. waves, boat traffic). To the contrary of the Pre-RD Group's conclusions, surface sediment data further support that some areas are not recovering and some hotspot are expanding or dispersing (see Appendix D.2 comments). In addition, there is significant seasonal and annual variability (and therefore uncertainty) in deposition/erosion patterns that are not captured by comparing 2 events 14 years apart (2004 and 2018).

Section 1.3. The stated accuracy of the multi-beam sonar survey is ±0.03 ft., which is less than 1 cm. Please provide greater explanation of this accuracy. Is this the accuracy of the device itself? How does

the accuracy change when operated from a moving vessel or encountering vessel wake? If the accuracy can change, please identify the conditions that would result in these changes.

Section 2.3. Please state the accuracy of the 2004 bathymetry data to provide context for bathymetry comparisons.

Figure 4. Please clarify the legend. It says "Bathymetric Change 2018 to 2004 (ft)." This is confusing because it is unclear whether negative or positive represents erosion or deposition. From the figure it appears that brown represents deposition and blue represents erosion, but the legend seems to imply the opposite since it lists the dates in reverse order.

Section 3, Storage Capacity. This paragraph notes that the river is depositing a substantial amount of sediment, and concludes that there is potential for some dredging to be replaced with capping and enhanced natural recovery (ENR). However, this appendix has also stated that there is shoaling above the authorized depth of the navigation channel. These statements seem to contradict each other. Localized areas will likely require site-specific determinations as to whether capping and ENR can be used. Presumably further material cannot be added where sedimentation has resulted in elevations near or above the authorized channel depth.

Specific Comments – Appendix D.2 - Surface Sediments

General. Within Appendix D.2 and the main text, we have serious concerns about the simplified natural recovery assumptions, the dismissal of dioxin/furan data, the use of metrics and statistics alternative to the ROD, and the evaluation of upriver/background data. In fact, we conclude that in some SMAS with areas of increasing concentrations (ex. RM7W-Arkema, Swan Island Lagoon, McCormick and Baxter, Downtown Reach boundary), the data indicate the need for prioritizing to achieve a more expedited cleanup. See more specific comments below.

Section 3. This discussion of dioxin/furan results is misleading. J-flagging dioxin/furan results is not unusual as in most cases concentrations are near the PQL. J-flagged data is normally considered acceptable for use. There is no question that the dioxin/furan congeners are present, there is just typical uncertainty regarding their concentrations that occurs near the PQL. The fact that Portland Harbor CULs are also near the PQL is not surprising, since dioxins/furans are the most toxic of the COCs at very low levels. All of these facts were known in advance of the investigation. Had the PRPs truly been concerned about the ability to use the data, they could have used a more specialized analytical method with lower detection limits, or at least raised the issue prior to the investigation. As it is, the data are considered acceptable for use and should be used for all the decisions for which they were intended.

Based on the discussion in the PDI report, it appears likely that the true goal of limiting use of the dioxin/furan data set is that these compounds are not demonstrating natural recovery, which contravenes the narrative that the PRPs are putting forward and their attempts to limit the focused

COCs to PCBs, PAHs, and DDx for the purposes of SMA delineation (e.g., see section 4.1 of the PDI report).

Downtown and Upstream Reach results should be separated here and in Table 1, so that the reader can draw their own conclusions about whether they are similar. Any proposals to combine the two data sets for any purpose should be supported by statistical tests showing no difference between them, to an acceptable degree of statistical certainty. In addition, after this point, there is little to no discussion of the Downtown or Upstream Reach sediment data, as the entire appendix seems focused on recovery. Results for these areas should be presented and discussed, including any differences between these areas.

Section 4. Comparison to RI data should not be the main or initial focus of this data presentation, as that was not any of the stated purposes for collecting the data listed in the ASAOC. An updated data set was to be used as a baseline for future monitoring and as a current data set to inform (along with remedial design sampling) SMA delineation. Differences between this statistically robust sampling effort and much older data collected in a spatially biased manner over a long period of time make a backward-looking evaluation of temporal trends problematic. At best, such observations may be qualitative and should appear after the ASAOC required elements, with full disclosure of the uncertainties. Because of its limitations, any such evaluation should be neutral and observational, and should not be used to change ROD elements such as CULs, RALs, SMA boundaries, or selected remedies.

This section just adds to the confusion by using several different interpolation techniques and comparing the data for different areas under each. These should be pared down to just the approach selected by EPA. Alternatively, the EPA approach should be presented first (both interpolation method and areas for comparison), followed by the approach the PRPs prefer if different, with the pros and cons clearly outlined. No more than two methods should be presented, and then only if there are meaningful differences in the results.

Section 4.1.2.1. SWACs should be calculated for the areas described in the ROD (site-wide, rolling RMs, SMAs) first, and only then the PRP-defined segments, which do not appear to have any particular geographic rationale related to features of the site. It should be clearly identified which approaches were approved/used by EPA and which are PRP-defined additions. Here and throughout the report, the PRP-added interpretations should be in their own section following the EPA-defined and ASAOC-identified data uses and interpretation approaches.

Table 4 shows that nearly all of these SWACs have very large standard deviations, in most cases greatly exceeding the SWAC and even the range of the data. Accordingly, few conclusions could be drawn from this information, particularly in comparison to other data sets.

Section 4.1.3. The question is not which method provides the best comparison to past data. Rather the stated use of this data set is for comparison to future post-remediation data. Assuming that future

monitoring events would use the same grid-random sampling approach, which method would be considered most appropriate for those comparisons and why?

Additionally, more discussion of the reasons for the differences among the methods would be helpful, for example, why the DDT values tended to be the most different among methods. In the third bullet, it would be useful to know what specific differences in the data sets results in differences in the SWACs, and which differences tend to result in higher or lower SWACs.

Section 4.1.4, page 11. This nomenclature for SIL-East and SIL-West is confusing. In general, Portland Harbor remedial documents have used east and west to refer to the shorelines on either bank of the river, but this nomenclature uses the same terms to refer to the upstream/downstream direction, which could create confusion.

Section 4.2. Only statistically significant decreases (or increases) should be described as a change in the text. Increases as well as decreases should be mentioned. The spatial patterns of increases, decreases, and no change should be discussed, and sweeping generalizations regarding natural recovery in the river avoided. It is clear from the tables that not all areas changed in the same manner. For instance, it would be interesting to know whether higher-concentration or lower-concentration areas experienced larger changes, or areas that are considered depositional or erosional. Large-scale generalizations will not be as useful in planning remedial design as area-specific discussions.

Based on close evaluation of Tables 5, 6, and 7, there appears to have been some decrease in PCB concentrations in certain areas of the river but not others, essentially no statistically significant changes in PAH concentrations overall, and a fair amount of increase in DDT concentrations in some areas as well as some decreases. This is not the impression that the text gives; the authors should strive for a more balanced and neutral interpretation of the data.

In addition, a statistical test alone is not enough to be sure a decrease has occurred. PCBs, PAHs, and DDx are all sums that may be affected by non-detects in the sums, particularly in lower-concentration areas. The report states that the analytical methods used in 2018 were more sensitive (lower detection limits), which would be expected and could give the appearance of a decrease in concentration where there hasn't actually been an environmental change. The influence of these changes in detection limits on the calculated sums and the effect this may have had on apparent decreases in concentrations between the FS and the baseline sampling must be evaluated and reported in this section along with any other potential confounding factors.

Section 4.2.3, page 14, and Table 8. Provide a discussion of potential explanations for why DDx and 2,3,4,7,8-PeCDF are higher in the depositional areas (in contrast to the other COCs which are generally lower in the depositional areas). Does this mean that these COCs are spreading from hotspots and getting deposited elsewhere? Figure 1c from Appendix D.2 shows a hotspot at RM 7W and a long lower-level patch of DDx contamination immediately downstream of RM 7W along the west shoreline. This area is a depositional area according to the bathymetry map in Appendix D.1, indicating the DDx was

likely transported and deposited there from the source at RM 7W. This indicates that the RM 7W area should be prioritized for earlier cleanup to prevent further transport. The same figure also seems to suggest transport into Swan Island Lagoon from a hotspot at the mouth, potentially suggesting another area where early action or containment is needed.

Section 4.2.4, page 16. "The remaining five SDUs identified for total PAHs… did not show significant changes [in SWAC]. Most of the SDU SWACs are below the total PAH CUL and, therefore, evaluations of recovery are not meaningful." The Sediment Decision Unit (SDU) SWACs are averaging over too large an area, as evidenced by the large standard deviations in the data in Table 9b. Although concentrations are changing, the changes are not statistically significant because the standard deviations are so large. Comparisons should focus on the areas where PAHs are above the cleanup level (CUL) and require remediation, rather than looking at entire SDUs.

Section 4.3. The first two sentences portray the evaluations in these two sections as lines of evidence for recovery, rather than neutrally evaluating and presenting the results. Evaluating whether recovery has already occurred was not an element of the ASAOC, rather it is a secondary evaluation that the PRPs wish to present. Therefore, it should not be the initial or primary focus of the report or appendices. This topic would be better addressed in its own separate appendix and would be more effective if it pulled together in one place other relevant lines of evidence, such as fish tissue or core data.

The same comments as for Section 4.2 above apply to this section. There is the added complication that this is an attempt to compare stations within 100 feet of one another over long and disparate time periods, with different sampling and analytical methods. The concentration differences described here (within a factor of 2) are well within the variability typically seen in field replicates, which are collected synoptically in time and much closer together than 100 feet. Added to the differences in detection limits as a confounding factor, as well as source control or interim cleanup actions that may have been conducted, it is difficult to discern whether these differences are meaningful indicators of natural recovery. Multiple sampling rounds over time using the same sampling design will be needed to draw statistically sound conclusions regarding whether natural recovery is occurring.

Section 4.3.2. All of the above notwithstanding, the pattern described in the bullets does not appear fully random, with higher concentration areas declining, moderate concentrations showing a mix of increase and decrease, and lower concentration areas increasing on average. This could indicate a spreading of concentrations out of hot spot areas to offshore or downstream areas of the river, or it could be due to an analytical or sampling design artifact. The low-concentration increases do not seem to be entirely random, given the larger changes than observed in the moderate and high areas. Some additional evaluation and discussion of these data could be useful in understanding the processes at work.

Again, more discussion of the spatial pattern of apparent changes would be helpful. If 66% of the sample pairs are showing decreases, then fully 1/3 are staying the same or increasing. If there is a spatial

pattern associated with these increases and decreases, this could be valuable information for remedial design.

Section 4.3.3. While these concentration differences are still relatively small given the above considerations (within a factor of 2), this pattern is striking and an example of the type of analysis that is helpful for remedial design. It does raise added concern about erosional areas potentially being a source to downstream areas, and the need for dredging in these areas rather than capping.

Section 5. For all of the reasons described above, it is too early to conclude that natural recovery is occurring throughout the river. There are only two data points in time, the standard deviations on the data are very large, and the apparent changes are well within field variability and artifacts that could be caused by sampling design and/or changes in analytical methods and detection limits. This was a baseline evaluation meant to be compared to future post-remediation monitoring events.

While it appears that some contaminants more than others (e.g., PCBs) are recovering to some degree in some areas, the report dramatically overstates the effectiveness of natural recovery. It is unknown what processes may have contributed to that recovery – whether it be contributions of cleaner sediments from upstream, source control, or interim cleanups upstream and within the site. This information could be used qualitatively to suggest support for the existing selected remedy, but not to quantitatively change CULs, RALs, or the selected remedy. PAHs, DDx, and dioxins/furans do not appear to be experiencing recovery to the same degree, and this bears closer evaluation. As discussed in the general comments above, SWACs from a site-wide sampling plan are not directly comparable to SWACs from the earlier hot-spot focused sampling. As stated in this section, "due to spatial variability in sample results, site-wide evaluations of DDx recovery are not instructive". This same principle should be applied to other COCs that have concentrations ranging over many orders of magnitude.

Tables 1 and 2. The title of Table 1 indicates it is a summary of *exceedances* of cleanup levels, but the table header says "number of samples *below* CUL". This is an apparent contradiction. *Below* seems correct based on the data, but please clarify whether these data are above or below the cleanup levels. Please also confirm that Table 2 is using the opposite approach; it lists the number and percent of samples *exceeding* the RALs.

Table 3. This site is commonly divided into three "lanes" as described in Section 4.1.4 of this appendix (navigation channel and east and west nearshore areas), but Table 3 only uses two categories and appears to combine the navigation channel with the east and west areas, based on the sample count. Please use consistent groupings, like those described in Section 4.1.4. If new groupings are used, please ensure that they are appropriately defined relative to the known groupings. Please ensure that these new groupings are explained descriptively and visually, specifically noting boundaries. Please also explain how this relates to Swan Island Lagoon: is it divided along the length or width? (How does this relate to the SIL-East and SIL-West defined on page 11 of this appendix?)

Table 3c. Discussion should be provided regarding the implications of a negative concentration as the lower confidence limit for DDx (and similarly for subsequent tables for other COCs). Presumably this is because the distribution is not normal; however, this is not addressed in the discussion.

Table 6b. Due to rounding, some of the segments that have statistically significant increases or decreases can show up as the same SWAC (e.g. RM 8.5-9.5 is 0.5 mg/kg in both). Please add another significant figure to illustrate the magnitude of the differences.

Table 7. The title of the table says this is by 1-mile segments, but the data in the table is grouped into larger segments. Please revise to clarify and make consistent.

Table 9. This table has a column for "side of river" and the SDUs are all labeled "both". Please correct this to specify East and West (or remove it because it is redundant with the SDU names that end with E and W). As written, it creates confusion.

Figure 1b. This figure shows total PAH exceedances of ESD CULs and RALs. The ESD has not been finalized and therefore, ROD criteria must also be shown. In addition, there is a second cPAH CUL in ROD Table 17 as well as a cPAH PTW criteria in Table 21. It would be helpful to also depict areas exceeding these cPAH criteria.

Figure 6. Note 2 refers to the boundary shown in Figure 4 but should be corrected to clarify which figure it is referring to. Figure 4 shows SWAC plots, not boundaries. Please clarify this note and figure references.

Figure 7b. Provide discussion of why TPAH concentrations have increased between RM 8 and RM 10 on the east nearshore area compared to the Feasibility Study (FS) data. Noting that concentrations upstream of RM10E have decreased, this may indicate transport of contamination from the RM11E area. Bathymetry data from Appendix D1 shows scour throughout this area.

Figure 11. Please clarify the legend to explain whether red indicates the RI/FS sample is higher than the PDI sample or vice versa. The legend says higher, but this appears to be incorrect, because the text implies that we should be seeing more locations with decreases than increases over time, which would be red (RI/FS sample is higher than PDI sample), but a visual review of the figure seems to show more green dots than red dots.

Figure 11. There are large areas that have no RI/FS sample locations shown. Please explain whether there are RI/FS samples collected in these areas and why none of them are shown. For example, the Remedial Investigation Report Map 2.1-15 j shows numerous surface sediment sampling locations in the navigation channel between RM 7 and 8. Figure 11 shows at least ten PDI samples in this river mile, yet there is no comparison to the RIFS samples. **Figure 14a – Figure 14c.** Of the 23 samples mentioned in note 2 that are not shown for scale reasons on Figure 14a, please state whether they were above or below the CUL and RAL. The same comment applies to subsequent figures for other COCs. These figures

should clarify whether the yellow boxes showing increased concentrations above the RAL are complete or if there are other samples not pictured that fall in that category.

Figure 14c. The figure label states that 7 samples are above the RAL and have increased concentrations compared to FS data, but there are more than 7 in the yellow box (at least 9 are shown within the box, plus some on the borders). Please clarify and explain.

Figure 15. The title says "in depositional areas" but should be modified to better reflect the figure content, showing more than depositional areas and including areas of elevation loss. Here and throughout the report when "erosional" areas are discussed, it would be helpful to differentiate areas of known sediment removal from areas of natural erosion.

Specific Comments – Appendix D.3 - Subsurface Sediments

General. We have significant concerns about natural recovery conclusions, dismissal of dioxin/furan data, and implications for refining SMAs and remedial technologies. See more specific comments below.

Section 3.1. This section suggests that similarities in exceedances of the RALs at depth between the FS data and the PDI cores suggests that the river is stable overall. This conclusion reaches too far based on the information provided. This is an active, dynamic river system that experiences tidal reversals and winter flooding, with large changes in flow throughout the year. Below a certain depth, the sediments may be relatively compacted and stable. However, there is evidence in the surface sediment data of erosion and transport of contaminated surface sediments downstream, as well as evidence that contaminated sediments move upstream from the site into the Downtown Reach. This comment should be modified and limited to subsurface sediments in non-erosional areas.

The discussion of dioxin/furan results on page 4 is misleading. J-flagging dioxin/furan results is not unusual as in most cases concentrations are near the PQL. J-flagged data is normally considered acceptable for use. There is no question that the dioxin/furan congeners are present, there is just typical uncertainty regarding their concentrations that occurs near the PQL. The fact that Portland Harbor CULs are also near the PQL is not surprising, since dioxins/furans are the most toxic of the COCs at very low levels. All of these facts were known in advance of the investigation. Had the PRPs truly been concerned about the ability to use the data, they could have used a more specialized analytical method with lower detection limits, or raised the issue prior to the investigation. As it is, the data are considered acceptable for use and should be used for all the decisions for which they were intended.

Sections 4.1 and 4.2. The simple ratios described here do not necessarily have anything to do with natural recovery. The core COC profile may instead simply reflect the time period at which discharges to the river were greatest from the adjacent facility or surrounding sources. The core profile may also represent the depth at which dissolved or free-phase COCs entered sediments from an adjacent upland facility. Any recovery evaluations within SDUs/SMAs should be carried out site-specifically in conjunction

with review of upland data and known transport/discharge pathways from the upland site. At this time, it is inappropriate to refine SMAs or technology assignments with this limited resolution of data. These types of evaluations must be done on a site-specific basis and performed later in the remedial design process using higher resolution, SMA specific pre-RD data.

Section 5. These conclusions regarding natural recovery should be tempered by the understanding that the contaminant distribution in some cores has been impacted by subsurface migration of contaminants from adjacent facilities, either free-phase or in groundwater, and by differential loading with time from surface sources. Simplistic ratios such as presented in this section cannot provide a quantitative measure of recovery without more detailed analysis and understanding of the conceptual site models for associated upland facilities.

Figure 2. The note 1 says that ratio labels represent the upper end of the range. Please create a separate category to differentiate values of 1 from values between 0.9 and 1.0.

Figure 9. Showing the average of such a variable measurement is not especially informative. Each SMA should be considered separately.

Specific Comments – Appendix D.4 - Sediment Traps

General. We have significant concerns with the ongoing transport, implications of sediment trap data for the Downstream Reach , the effects of flow reversals on transport, use of site-wide averages, dismissal of dioxin/furan data, suspended sediment loads leaving the Portland Harbor study area, and the combining of the Downtown and Upstream Reach data.

Upstream Area. Based on the COC concentrations measured in upstream sediment traps, source control is needed, in particular for PCBs. No improvement has been observed between 2006 and 2018/2019. If ongoing sources in the range of the cleanup level continue to exist, additional remediation technologies may be needed.

Section 1.1. Sediment traps positioned at the boundary between the site and the Downtown Reach may also reflect suspended material that flows upstream from the site into the Downtown Reach during tidal reversals and low-flow conditions.

Section 1.2. Another use of the sediment trap data at the Site/Downtown Reach boundary would be to determine whether suspended particles from the site are influencing COC concentrations in the Downtown Reach due to upstream transport and mixing with particles coming downstream. While the current PDI report combines the Downtown Reach with the Upstream Reach in order to evaluate background concentrations and influences from upstream on the site, the conceptual site model should include this potential upstream transport and the possibility that suspended particles from the site mix with particles from upstream within the lower portions of the Downtown Reach. The sediment trap data

should be examined to refine our understanding of the transport processes in this area and better understand whether it is appropriate to combine the Downtown and Upstream Reaches for any data use.

Section 3.1. The greater sediment accumulation observed in the sediment traps at the site/Downtown Reach boundary during low-flow conditions than at the Downtown/Upstream Reach boundary supports the hypothesis that an observable quantity of sediments moves upstream from the site into the Downtown Reach during low-flow conditions. Downstream transport is more prevalent during storm and high-flow conditions, as would be expected. This observation does not support combining the Downtown and Upstream Reaches for background evaluations.

Section 3.2, first paragraph. A site-wide average is relatively meaningless given the large grain-size differences between the nearshore areas and the navigation channel. How do these TOC and grain size results compare to the nearshore areas of the site?

Section 3.2, PCBs. This discussion fails to recognize the potential influence of site sediments on the Downtown Reach boundary sediment traps. Higher concentrations of PCBs in these traps compared to the upstream traps are likely a combination of influences from the site and from the Downtown Reach, particularly as the highest concentration was observed under low-flow conditions when upstream transport is most likely. These comments also apply to the PAH results and to Section 5, Spatial Trends.

Section 3.2.1. This discussion of dioxin/furan results is misleading. J-flagging dioxin/furan results is not unusual as in most cases concentrations are near the PQL. J-flagged data is normally considered acceptable for use. There is no question that the dioxin/furan congeners are present, there is just typical uncertainty regarding their concentrations that occurs near the PQL. The fact that Portland Harbor CULs are also near the PQL is not surprising, since dioxins/furans are the most toxic of the COCs at very low levels. All of these facts were known in advance of the investigation. Had the PRPs truly been concerned about the ability to use the data, they could have used a more specialized analytical method with lower detection limits, or raised the issue prior to the investigation. As it is, the data are considered acceptable for use and should be used for all the decisions for which they were intended.

Section 3.2.2. How do these observations regarding COC concentrations in the sediment traps correlate, if at all, to sediment accumulation in the traps? Is this likely to be a river geomorphology effect or some other cause?

Section 3.3. Surface sediments immediately downstream of the traps should also be evaluated for influence on sediments in the traps. In addition, given that sediment trap particles were found to be finer-grained than surface sediments, a sediment transport evaluation should be conducted based on the grain size distribution in the traps to determine whether these particles would likely settle out onto the site or would be more likely to pass through the Portland Harbor site to downstream areas. For example, in the Lower Duwamish Waterway, fully 50% of the particles entering the site from upriver are

estimated to pass entirely through the site and out into Elliott Bay. While the dynamics of these two rivers are different, it is still an important question. This comment also applies to Section 5.

Section 5, Chemistry Trends Over Time. Again, it must be noted that concentrations in the traps at the upstream boundary of the site may be influenced by fine-grained sediments from the site, and not only from the Downtown Reach. Regardless, it appears there may be important differences between the Downtown Reach and the Upstream Reach that do not support combining data sets from these two areas, particularly for the purposes of background estimates.

Specific Comments – Appendix D.5 - Surface Water

We did a high-level review of the surface water appendix but have no major comments at this time. The Pre-RD Group did not appear to make the same types of claims regarding natural recovery as for other data, probably due to the greater differences in surface water sampling methods, detection limits, flows, and other conditions between the RI and PDI events.

Specific Comments – Appendix D.6 - Fish Tissue

General. We have significant concerns about the proposal to change fish tissue criteria, conclusions about the fish tracking study and natural recovery, background evaluations, detection limits, and combining downtown and upstream reach data.

Section 1.2. These sections as described do not appear to have much relationship to where fish might spend their time in the river (e.g., locations where people gather to fish because they're more abundant, near pilings and other anthropogenic and natural habitat features). Although, this may not be possible with a species like small mouth bass which are assumed to have a home range of around 1-mile. Additional studies to answer questions about sediment concentrations relationship to tissue concentrations should be done with species with high location fidelity and potentially lower trophic levels (e.g. clams and sculpin). See Yakama Nation's comments on the fish tracking study for more on this topic. However, it would be helpful if Figures 1a-1g showed the number of fish caught at each location and if the text described whether there were specific habitats or other features of the river (natural or otherwise) that appeared to be related to how many fish were caught.

Section 2.1. It appears inappropriate to try and relate small mouth bass tissue concentrations to site specific sediment concentrations. They are near the top of the food chain as a predator so will be integrating everything that is within their home range including things that swim into their area. This adds way too much noise into a dataset but efforts to make other biota with higher site fidelity and at lower trophic levels would be more appropriate. In addition, small fish tissue concentrations in areas where many fish were caught should be calculated and reported as a separate average for that location. If fish tissue concentrations differ in these areas from the segment-wide or site-wide average, it may be

an indication of preferred habitat and the sediment concentrations there. In any case, the hypothesis should be tested using the data collected rather than assuming that averaging across an entire segment is appropriate.

Box plots in Figures 2 and 3 clearly do show differences for PCBs and DDT between the site, Downtown Reach and Upriver that do not suggest that the data for Downtown and Upriver Reaches should be combined. Figures 3 and 4 show obvious spikes near specific facilities that are different from surrounding areas and indicate at least some site fidelity within segments.

Section 2.2. These data are intended to inform long-term monitoring efforts, and fish target tissue levels are appropriately risk-based. Concentrations of PCBs and pesticides in the larger watershed may contribute to upstream levels that are currently elevated above safe concentrations; however, this does not suggest that the targets should be changed. Global and regional background concentrations of PCBs and pesticides are declining over time, as are detection limits. These values are not enforceable CULs for the site and therefore, it is not necessary to change them on the basis of whether they are realistically achievable within a given timeframe. It is imperative that EPA evaluate progress toward the goal of having safe and abundant fish in the river that can support Yakama Nation Treaty Right of fishing in the Willamette River.

Section 3.1.1. From reviewing Figures 6a-6f, it is difficult to credit any meaningful changes in these concentration distributions. The range of most observations as well as the higher-concentration data points do not appear to be declining over the years. The only thing that has obviously changed over time is the lower end of the distribution, which is clearly a detection limit truncation issue. In other words, the detection limits have declined over the years, making it appear that the bottom end of the concentration distribution is lower in later years. A statistical test would not take this into account and might conclude that there is a statistically significant change, when in fact this is a laboratory artifact.

After correcting for the above, if any statistically significant trends remain, please comment on the magnitude of those changes compared to that required to achieve the target tissue levels.

Section 4. This study has provided an updated small mouth bass tissue data set throughout the site and Downtown and Upstream Reaches, which was the primary goal of the study. However, the fact remains different trophic levels and biota have not been monitored for a pre-remedial design baseline. Comments on Sections 2 and 3 above apply to the remaining conclusions in this section. Specifically, Yakama Nation disagrees that there is sufficient evidence to conclude that recovery has occurred given the statistical issues identified. Yakama Nation also disagrees that the target tissue levels or risk-based levels on which they are based should be modified.

Specific Comments – Appendix D.7 - Fish Tracking

The following provides a set of high level comments on the 2019 Fish Tracking Results and Analysis PDI Evaluation Report Portland Harbor Pre-Remedial Design Investigation and Baseline Sampling Portland Harbor Superfund Site Portland, Oregon. Prepared by AECOM and Geosyntec.

- Sample size of 40 fish is too small to make definitive assumptions about the typical home range of smallmouth bass.
- Sample age group was from 2 to 5 years. Smallmouth bass have a general lifespan of 6 to 15 years. The collection methods may be targeting smaller younger aged fish. Collection methods should target all age classes.
- Sample set does not include a full year of data as the study was intended to do. It only includes data for a 9 month span and states that the remaining 3 months will be reported as an addendum. It is unclear why a report was submitted without the full year of data. The separation in reporting will be disjointed as a result.
- What are the guarantees that the remaining 3 months of the study will be conducted and reported?
- Will the remaining 3 months be conducted during pre-spawn/spawn/post-spawn timeframe?
- A multiyear study would help to determine site fidelity and duration to nesting/spawning areas for individual tagged fish.
- The report states that monthly monitoring was conducted but it appears that several months were skipped: July, September, October and January. The reason for these lapses should be provided.
- The study states that smallmouth bass are not a reliable metric for monitoring sediment contaminant intake on a local scale due to the range of mobility across the population and variability in movement patterns. This statement supports the need to sample a suite of receptors such as clams, mussel, black crappie, peamouth, northern pike minnow, large-scale sucker, carp, juvenile Chinook salmon, Pacific lamprey ammocoetes, and juvenile white sturgeon to provide empirical measures of bioaccumulation and exposure for different receptor areas of the site.

Specific Comments – Appendix D.8 - Porewater Background

General. We have significant concerns about the proposed porewater background criteria, underlying assumptions about site-wide sediment conditions, and the combination of Downtown and Upstream Reach data.

Section 1.1. This discussion of the rationale for this study element raises a number of questions for which clarifications would be appreciated:

- If manganese is not a COC for Portland Harbor, why was it included in this study?
- Why was the Downtown Reach considered appropriate to include, given that cleanup is still ongoing in that reach and there may continue to be anthropogenic contributions of metals to

groundwater, sediments, and surface water? Clear differences in organic COC concentrations are reported for the Upstream and Downtown reaches in earlier sections of this report, and this could also be the case for metals.

- Why was it assumed that sediments would always be fine-grained and anoxic in the site-specific transition zones for which these background concentrations are being developed? The upland sites the transition zones are associated with are not likely to have organic-rich wetlands as source areas, as did the stations selected for sampling.

Were these porewater samples located in areas with upwelling groundwater, so that they would be similar to the transition zones? Otherwise, the porewater would likely represent influences from the sediment or river water rather than groundwater, and the levels could be different among these three sources to porewater.

Section 3.3. Please discuss and provide ProUCL output for how it was decided that the data were normally distributed. Somewhat for arsenic and clearly for manganese, this does not appear to be the case based on the boxplots, but neither the full data distribution nor the ProUCL output are shown. It is fairly obvious for manganese given the large number of data points above the 95th UCL, which should not occur under a normal distribution.

In addition, the manganese distribution appears to have a clear outlier at Station PDI-WP-S266. This sample is also elevated for arsenic. Given that this station is beyond the upstream boundary of the Upstream Reach, is somewhat different in sediment characteristics, and appears to have porewater concentrations exceeding those of both the Downtown and Upstream reaches, it should be excluded and the statistics recalculated.

Similarly, results for the Downtown Reach and Upstream Reach should be tested to determine if they are statistically different before combining them to calculate background. Porewater concentrations up to RM 18.5 appear to be higher than those upstream, roughly corresponding to the boundary between the two reaches. Consistent with other study elements, only the upstream reach, which is further from anthropogenic influences, should be considered “natural” background. However, it is possible that there are insufficient data to provide acceptable statistical power, even with the combined set of data.

Section 4. The recommended background levels in this section are biased upward in a number of ways:

- Assumption of a normal distribution for a skewed data set.
- Inclusion of the Downtown Reach, which represents the upper half of the data set for both metals and is likely still impacted by anthropogenic influences.
- Inclusion of the outlier upstream of the Upstream Reach.
- Insufficient sample size to adequately characterize the distribution.
- Use of the BTV rather than a more conservative 95th UCL or 90/90 UTL.

In addition, the language inappropriately draws conclusions that are within EPA's discretion to decide.

Finally, regardless of whether groundwater-based standards apply, groundwater discharging through a transition zone must be protective of ambient water quality criteria and other surface water standards set by EPA for Portland Harbor.

Specific Comments – Appendix D.9 - Summary Statistics

We have not had adequate time to complete a review of this appendix. However, see statistics-related comments in other sections of this submittal.

In general, we have serious concerns about the statistics used in this report. Rather than presenting the results in a neutral and scientifically sound manner, the report cherry-picks the data and uses statistical manipulation and misleading data presentations to support a clear agenda of reopening the ROD.

- Remedial Action Objectives (RAOs) and cleanup criteria (PTW, RALs, CULs, targets) must be evaluated using the scales and methods outlined in the ROD.
- Site-wide statistics are meaningless for use in remedial design at the SMA level. When distinct sources are allowed to be averaged over 10 river miles, significant mathematical dilution masks the impacts and is not useful except for large-scale qualitative comparisons.
- This monitoring program must be forward-looking and compared to future sampling events that are similarly designed. Backward-looking comparisons to RI/FS data is an 'apples to oranges' comparison because the studies were designed for entirely different purposes and used different methods, spatial coverages, and detection limits.

Specific Comments – Appendix E - Dioxins/Furans

We have not had adequate time to complete a review of this appendix. However, see dioxin/furan related comments in other sections of this submittal. It is inappropriate to dismiss this dataset or these contaminants. They are an important risk driver that must be tracked at Portland Harbor.

Specific Comments – Appendix F - Background

We have not had adequate time to complete a review of this appendix. However, see background related comments in other sections of this submittal. We have significant concerns about ongoing

sources in the Downtown Reach affecting background evaluations. These sources are in various stages of source control and cleanup and, therefore, background is expected to improve over time.

Specific Comments – Appendix G - Updated Risk Analysis

General. The PDI report proposed reanalysis of risk is outside of the scope of the ASAOC and would require a ROD amendment to implement. This section should be discarded outright. In addition, it is inappropriate for the Pre-RD group to randomly select the "newest" fish consumption survey in the Pacific Northwest and decide they are more representative for a tribal fisher scenario at Portland Harbor. This tribe isn't even involved in the Portland Harbor cleanup and has very different food source patterns. The 1994 CRITFC study is still the only study that includes Yakama Nation Members fish consumption and would therefore be the most applicable to Portland Harbor. In addition, 175 grams/day is the fish consumption rate used in the ambient water quality criteria for OR and WA which would be considered an ARAR.

Appendix G. The PDI report states that it is applying more "up to date consumption rates;" however, the goal should not be to model the current conditions but to be protective of the Yakama Nation's Treaty rights to fishing in the area. In its report to USEPA regarding fish consumption and environmental justice, the National Environmental Justice Advisory Committee (NEJAC) noted that "[t]o the extent that people are prevented from consuming fish as they had or would due to contamination or depletion of the fish and aquatic ecosystems that support the fish, there are important implications for USEPA's and other agencies' risk assessment, risk management, and risk communication approaches" (NEJAC, 2002). To address suppression effects, NEJAC recommended that USEPA should identify appropriate "baselines" that reflect the more robust levels of consumption and employ these baselines in risk assessment and regulatory decisions. An appropriate baseline might mean examination into what people would consume were there "fair access for all to a full range of resources," or were the conditions fulfilled for full exercise of treaty- and trust-protected rights and purposes.

Appendix G. The PDI report proposes changing the exposure assumptions regarding fish consumption rates, resulting in higher fish tissue target concentrations of COCs. Appendix G states that the old risk calculations are based on unsupported assumptions because surveys found that respondents do not fish as much as the previous calculations state, and most of what they catch is migratory fish. The risk analysis should protect the tribes' ability to fish as provided under their treaties and it should evaluate tribal risk in the ranges of potential tribal consumption, which should not be a one-size fits all approach. In addition, fish consumption surveys utilized in the ROD are considered a suppressed rate and would be considered under protective of the fishing right retained under Yakama Nation's Treaty of 1855.

Appendix G. In re-evaluating exposure assumptions for tribal fishers in the PDI report scenario, fish consumption rates were calculated based on an average of 95th percentile rates from three tribal studies. For two of those studies (Polissar, 2016a and 2016b), consumption rates are presented based on two survey methods: the National Cancer Institute (NCI) method and the Food Frequency

Questionnaire (FFQ) method. However, the rates calculated for the PDI report scenario are based only on the NCI method results, which are significantly lower than the FFQ results. The report should explain the rationale for and implications of using only the NCI results. Using the FFQ rates instead would result in an average 95th percentile rate nearly twice as high as that included in the PDI report scenario (296.3 grams per day). Note also that the consumption surveys for the Nez Perce Tribe (Polissar 2016a) and the Shoshone-Bannock Tribes (Polissar 2016b) both note that the survey results reflect suppression effects, and do not reflect baseline (heritage) consumption rates.

Specific Comments – Appendix H - Food Web Model

We have not had adequate time to review this appendix expect to submit additional comments on or before July 19, 2019. However, this is a topic that has already been heavily debated, evaluated, and decided through the final Feasibility Study dispute resolution process documented in the Administrative Record. Rehashing the argument is not a worthwhile use of time, especially with the expedited timeline expectations at Portland Harbor.

Specific Comments – Appendix I - Updated RALs

General. This appendix proposes new RALs, which is completely outside of the scope of the ASAOC. This is a blatant attempt to reopen the ROD and would add years, if not decades, to the cleanup process. We urge EPA to reject this appendix in its entirety. As stated early, the current RALs should be used to move forward with hotspot source removal.

See also comment on App J, Section 4.1.2.1 on SWAC uncertainty. The RAL curves are based on these SWAC calculations.

Section 2 and 3. Appendix I uses the mean value for measured upstream sediment concentrations. Table 3.1 (main body) uses the 95 UCL on the mean to establish background. This is inconsistent. Table 3.1 should also use the mean.

Section 2.2. Page 3 says "Consistent with the FS/ROD, upstream data were used as the basis for selecting bed replacement values (BRVs), except for DDx, for which USEPA used a risk-based preliminary remediation goal (PRG) as the BRV." As written, it is unclear whether the "except" means that DDx also used the upstream data, meaning DDx is an exception to the rule of consistency with the FS/ROD, or that AECOM/Geosyntec maintained the risk-based value, making DDx an exception to the method used for other COCs. Table 4 states that the upstream data was used for DDx, but the text should be revised for clarity.

Section 3.4. Page 9 of Appendix I states that the site-wide SWAC may be above the target SWAC as a result of the difference between the navigation channel RALs and the nearshore RALs. This demonstrates that the new proposed RALs are insufficiently protective.

Specific Comments – Appendix J - Refined SMAs

General. This entire appendix is rendered unusable by the use of "updated" RALs that in turn rest on a number of unfounded assumptions regarding natural recovery and background concentrations, modifications to risk assessment parameters, and adoption of the ESD. If the Pre-RD group wants to present an analysis based on its proposals for revising the RALs, EPA cannot stop them from doing so. However, the Pre-RD group cannot assume or direct that the RALs will be revised. In addition, because this appendix is completely outside the scope of the ASAOC and ROD, EPA should not allow this topic to detract from time-sensitive work. This appendix should be rejected outright or, at a minimum, subject to an alternative, more lengthy review timeline.

Appendix J. The proposed new SMAs are based only on surface data. However, the ROD requires consideration of subsurface data as well, see the ROD Responsiveness Summary Section 2.16 ("The updated remedial footprint, using contemporary surface and subsurface sediment data, will be used to apply the decision tree") and Section 4.1.7 ("Subsurface contamination data will be collected, refined and evaluated in defining the boundaries of active remediation areas during remedial design phase of the project.") This is because in some areas, subsurface sediments mix with surface sediments due to scour, and chemicals can partition from subsurface sediments to porewater and be advected upwards. Please evaluate proposed new SMAs using both surface and subsurface data.

Section 1. This evaluation does not comply with the ASAOC or ROD. To meet the intent of the ASAOC, there should be a straightforward analysis of apparent SMA boundaries (subject to remedial design sampling) based on the existing RALs for all COCs currently in the ROD, updating the SMA boundaries using just the new data collected as part of baseline monitoring. This would also allow a more transparent comparison of the differences between the ROD approach and use of the Pre-RD Group's proposed RALs, which are not limited, as claimed, to minor differences in GIS interpolation and post-processing.

Section 2.1. We rely on EPA to do a thorough evaluation to determine acceptability and compatibility of data added outside of the PDI and baseline dataset. . This refinement should be postponed and conducted on an SMA-by-SMA basis following remedial design sampling. Note that we have made previous comments about the importance of retaining older RI/FS data due to the heterogeneity of the system and difficulty in truly reoccupying stations.

Sections 2.3 and 2.6. As commented above, any proposed updates to SMAs should be based solely on the new data and not assume changes to the RALs, number of focused COCs, principal threat waste (PTW) category, or any other facet of the ROD. PTW and NAPL areas should be included in the SMAs

pending additional remedial design sampling, rather than excluded ahead of time. This would provide a more conservative and comparable estimate of the changes that may have realistically occurred. Unilateral exclusion of these areas in contravention of the ROD exaggerates the amount of recovery that has occurred and inappropriately reduces the remediation areas well below that needed to achieve ROD RAOs.

Appendix J, Section 2.6. Section 2.6 says "The ROD NAPL footprint is primarily neutral or depositional (see Figure 4d from Appendix D.1)." It appears mainly neutral, not depositional, in Figure 4d, thus the reader should not interpret this statement to mean that we can rely on deposition to address NAPL. Please remove the depositional description and revise the text to indicate that the early action at Gasco will address the NAPL footprint so it will not require inclusion in a SMA.

Section 3.1. It is impossible to evaluate the claim that current SMA areas are within the ROD SMA areas, given the apples to oranges nature of the comparison. However, the navigation channel appears to have quite different mapping of SMAs between RM 5 and 6.5 between the two data sets. This could be due to the sparse amount of data collected in the navigation channel as well as the changes the Pre-RD group made to interpretation criteria. This result further underscores the need to withhold decisions or conclusions on the SMA boundaries pending remedial design sampling.

The refined SMAs, as presented in this report, are not protective of human health and the environment. They exclude PTW and NAPL areas, as well as areas known to be contaminated with dioxins/furans such as Willamette Cove, presume that any risk below $1x10^{-3}$ is acceptable for subsistence fishers and that fish do not spend much time in localized preferred habitats, and rely on other unprotective and unsupported assumptions that are solely and intentionally designed to minimize the amount and cost of cleanup. These "refined" SMAs are the end result and goal of the entire set of unsupported assumptions and proposed changes to the ROD CULs, RALs, data interpretation approaches, and remedies presented throughout this PDI report.

Yakama Nation urges EPA to refine SMA boundaries only after the remedial design sampling is completed, and to conduct its own evaluation of the SMA boundaries using the PDI data along with the existing ROD CULs/RALs/PTW categories.

Section 3.2. These volume estimates are unreliable, given the revisions to the RALs used to generate them and all the other issues identified above, the very general assumptions about depth being used, and the lack of remedial design samples. Volume estimates should be updated after remedial design sampling. These are not useful for realistic planning purposes, and seem mainly designed to support the overall narrative that much less cleanup is required.

Section 3.3. These post-construction SWACs suffer from the same issues as the SMA boundary refinement, and should be recalculated by EPA in conformance with the ROD.

Section 3.4, bullets 3 and 4. These conclusions are not necessarily valid, as they rest on unsupported assumptions and evaluations. Contaminants with risk-based values below detection limits are nevertheless associated with risk whenever detected. Comments on the background analysis for arsenic are provided elsewhere; the data do not support the changes proposed. The Pre-RD group should not presume changes to the RAL that only EPA can make, but should at a minimum, present an analysis based on ROD RALs and if they wish, their proposed changes.

Section 3.5. Many of these issues are addressed elsewhere in our comments, including use of historical data and exclusion of PTW and NAPL. The first bullet is a further attempt to avoid including areas with dioxin/furan exceedances of the RALs, even when such contamination is known to be present and a clear result of industrial activities at neighboring facilities.
The "too small to construct" areas are a direct result of the SMA delineation methodology used, and should be re-evaluated once a more appropriate analysis is conducted. If smaller areas with high risk are observed, they should be merged with nearby larger areas for remediation.

Section 4. This entire section is very misleading, in making it appear that risk targets will be met post-remediation. This conclusion rests on modifications to the risk assessment, modifications to the RALs, assumptions of natural recovery, and failure to focus on the key pathways of fish consumption by humans and wildlife. On the flimsiest of pretexts, the Pre-RD group claims that there is no way to extrapolate between sediment and fish tissue, despite this having been accomplished at most riverine Superfund sites. This allows the Pre-RD group to avoid discussing the most sensitive receptors and pathways in their evaluation of risks. There is no obvious purpose to this discussion in this report other than an attempt to reassure decision-makers in advance that a less comprehensive cleanup would be protective. There may be no way to accurately determine the protectiveness of the cleanup until the actual post-remediation monitoring is conducted, and no conclusions should be drawn in advance.

Table 5. Table 5 shows that PCBs and PAHs and some of the dioxins do not meet the target SWAC with these new SMAs. Therefore, the SMAs should be expanded to meet the target SWACs, particularly for PAHs in the navigation channel.

Figure 10. Swan Island Lagoon was previously an SMA, but in the revised SMA footprints, only a small portion of it is in an SMA because the PCB RAL has increased. Swan Island Lagoon may not be subject to the same deposition and recovery rates as elsewhere and may have different natural resource exposure patterns than elsewhere since it is physically separated from the main river channel, so decreasing the Swan Island remedial footprint to such a large extent may not achieve long term cleanup levels that are protective of organisms with small home ranges. Likelihood of recovery should be considered when developing the remedial design in this area.

Specific Comments – Appendix K – Cap amendments and PTW Considerations
Specific Comments – Appendix L – Remedial Technology Considerations

We have not had adequate time to review these two appendices and may submit additional comments on or before July 19, 2019. However, it seems premature to make cap amendment and remedial technology recommendations with this level of data. These evaluations should be done on an SMA-by-SMA basis later in the remedial design process with higher resolution pre-RD data.

Specific Comments – Appendix M – Long-term Monitoring Recommendations

General. We intend to submit more specific recommendations for long-term monitoring on or before July 19, 2019. In general, collection of this baseline and pre-design investigation data set is a very useful and significant accomplishment. It is important for EPA and the TCT to evaluate near-term and long-term monitoring needs now that we have an initial baseline data set. Bearing in mind the 2016 TCT discussions and EPA's recommendations for the various types of monitoring, this baseline meets some, but not all, of these needs.

Section 1.1. Continuation of sediment trap monitoring could be useful in future monitoring events to evaluate progress in source control and cleanup upstream of the site and to continue to refine natural recovery modeling and predicted timeframes post-remediation.

In general, it is too early to eliminate COCs from post-remediation monitoring. At least one round of post-remediation monitoring should be conducted for all COCs to confirm that some COCs are below ROD cleanup levels (CULs). During remediation, COCs can be introduced into the water column, causing spikes in fish tissue concentrations and resuspending and transporting sediments. The COCs that were below CULs in this pre-remediation round of monitoring should be reviewed in the post-remediation sampling to confirm that remedial activities have not impacted sediment or tissue quality. At that point, it would be appropriate to drop some COCs from longer-term monitoring if they are confirmed to be below CULs.

The ESD is not final, and no assumptions should be made regarding it. If and when it is finalized, then the data can be reviewed against those CULs, subject to the above caveats. There are some very significant areas containing cPAHs that will be remediated as part of the cleanup, and cPAHs should be monitored at least once post-remediation regardless of the selected CULs.
No COCs should be eliminated from monitoring due to detection limit issues. If CULs are below detection limits, more sensitive methods should be used if possible. If that is not possible, it is still the case that any detected values are above CULs. Monitoring can be used to ensure that these COCs are undetected, which would be a minimum requirement for compliance.

Section 2. As noted above, Yakama Nation does not consider it appropriate to eliminate COCs for all future monitoring rounds at this time. However, if and when COCs are considered for elimination, concentrations in sediment, surface water, and tissue should be considered as a whole, rather than separate consideration of COCs in different media. Some COCs will be more measurable and more

concentrated in specific media. Nevertheless, the ecosystem is interrelated, and it will be helpful to understand the concentrations in all three media for any COCs that remain above CULs.

Sections 2.1-2.3. COCs with CULs below detection limits should not be eliminated based on percent detection less than 10%. Any detections indicate that they may be more widely present above CULs but below detection limits.

A finer spatial scale than site-wide statistics is needed in determining whether to monitor rarely-detected COCs. It may be that some chemicals (e.g., pesticides/herbicides, cPAHs, or metals/butyltins) are related to certain facilities adjacent to specific SMAs. Any such patterns should be noted, and if these patterns remain post-remediation, COCs that are only detected in specific areas could be retained only in those areas until full compliance is demonstrated.